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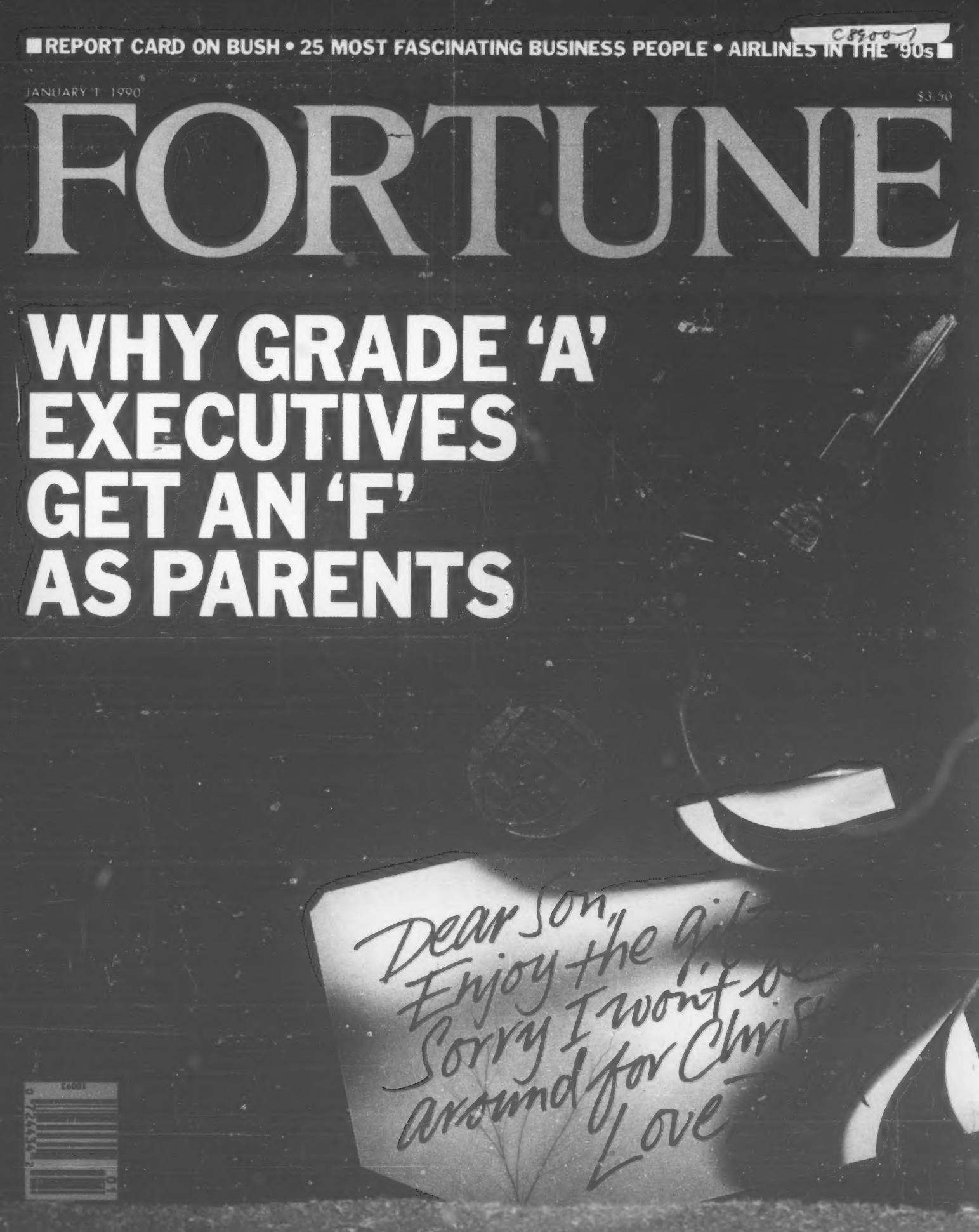
FORTUNE

WHY GRADE 'A' EXECUTIVES GET AN 'F' AS PARENTS



JANUARY 1, 1990

FORTUNE

ABOVE: John Harding photographed Darren Butler and his father, Bob, a Chevron executive, at a Little League soccer tournament in Buena Vista, California.

COVER: Photograph by Rita Maas; card lettering by Tim Girvin.

"You can always put things off for the future, but you can't get back the years with your kids."

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EXECUTIVE LIFE/Cover Story

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The qualities that make for corporate achievement—intensity and single-mindedness—are often the opposite of what's needed to be an effective mom or dad. That's why successful executives have more trouble raising their kids than all but the very poor. Some parents show how to avoid the worst mistakes. *by Brian O'Reilly*

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"We are not the sort of people you can take home to mother."

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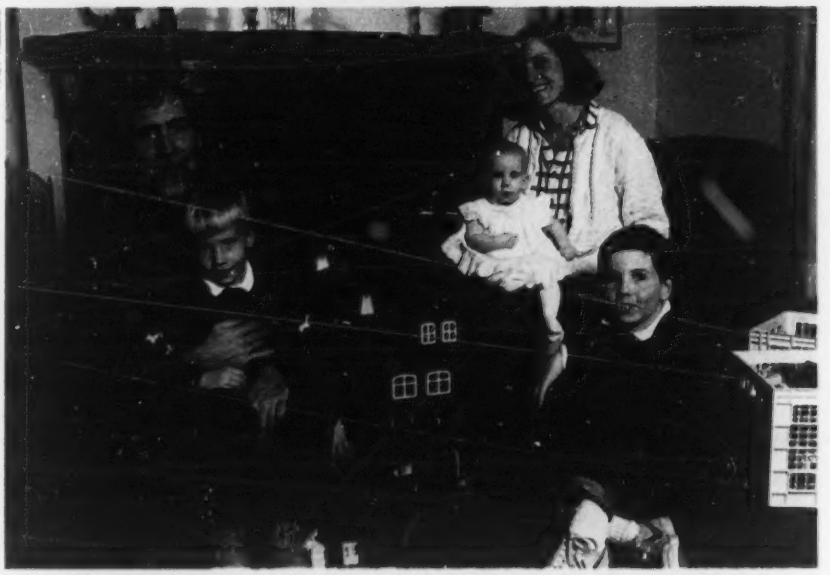
ANDY FREEBERG

Writer Brian O'Reilly at home with wife Gail and children Brendan, Mary, and Paul

THE IDEA came to writer Brian O'Reilly when preparing his recent article on executive health. What, he asked AT&T's medical director, caused its managers the most stress? The rather surprising answer: their children.

That led to this issue's cover story on the executive as parent. O'Reilly invested six weeks in interviewing dozens of psychologists, drug experts, educators—and executives and their children. Their comments reveal rather consistent differences between kids who wind up on the right track and those who find themselves on a troubled path. As O'Reilly and reporter Sara Hammes discovered, the same qualities that serve so well in an executive career—single-mindedness, intensity, a quest for perfection and control—may lead to trouble when dealing with your children.

Just as not spending time simply talking and listening to your children can be damaging, so too can trying to be their best friend by never saying no. Says O'Reilly, himself a father of three: "Kids appreciate and want parents to set limits. It makes them feel secure."

Supervising the story, senior editor Julie Connelly concluded, "Being a parent does not mean just preparing your kids for Stanford or Harvard. It means helping them feel good about themselves in doing whatever makes them happy, not what makes you happy." For some further guidance from the experts, see page 36.

We at FORTUNE share a special bond with you, our reader, and we thought you would be interested in a brief annual report on our magazine. It's gratifying to tell you that in 1989, FORTUNE set records in all departments. Our advertising pages rose 16%, and our advertising revenues were up 22%. We are now the nation's fifth-largest magazine in the former category and the eighth largest in the latter—and that is out of 11,556 magazines published in the U.S. Other business magazines did well too, but FORTUNE's gains in ad pages were the biggest of the bunch.

Our circulation also hit a new high, averaging 775,000 copies—of which about 110,000 are sold outside the U.S. That's an indication to us that we are serving you well—and you have our pledge that we will do even better in 1990 and beyond. Happy New Year!

Marshall Loeb
MANAGING EDITOR

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of **PepsiCo** and chairman of its executive committee, has long been a proponent of opening trade with the Soviets. His counsel: "If you want to go, better get there now. If you wait, someone else will have the business." **– Mark Alpert**

AH, NEXT SPRING IN BUDAPEST

■ Now that the Cold War is over, the hot season for travel to Eastern Europe is about to begin. **Hyatt**, **Marriott**, **Sheraton**, and some other chains farsightedly opened

A new sight in Warsaw

hotels in different capitals.

Besides them, locally owned hotels are plentiful and rate from bumpy to just fine. Jonathan Bodlender, chairman of **Horwath & Horwath**, the London hotel consulting firm, cites Hungary's hostelries "good by any standard." East Berlin's Hotel Palast gets favorable reviews, as do the Intercontinental franchises in Prague and Budapest. Rates for a double room range from $135 to $200 at the Budapest Hilton and $100 to $185 at the Warsaw Marriott.

Getting a seat on a plane may be harder than finding a bed. Eastern Europe's flag carriers, including Czechoslovakia's CSA airline and Poland's LOT, have direct flights from the U.S., but they are usually heavily booked. Among U.S. airlines, **Pan Am** has the largest number of direct flights: three times a week from New York's JFK to Warsaw and Budapest, and weekly from JFK to Prague. **UAL**'s United Airlines and **AMR**'s American Airlines will start Chicago-Warsaw flights in May, pending Polish permission. U.S. citizens need visas to visit all Eastern European countries. **– R.J.**

BANKS—AND SECOND WORLD DEBT

■ U.S. banks see opportunities in Eastern Europe—but don't expect a replay of their disastrous lending spree in the Third World. Says George Salem, a senior banking analyst at **Prudential-Bache**: "They will go in a toe at a time . . . Make that a toenail."

BankAmerica, **Chase Manhattan**, and **Citicorp**, among a few others, are already there, but their loans are minimal (see table). **Manufacturers Hanover** has a Bucharest branch, and Citi has an 80% stake in a Budapest subsidiary.

U.S. banks have lent directly to East European governments. But they prefer to act as middlemen between Western and Eastern dealmakers who often find themselves confronted by nonconvertible currencies.

What's next? Probably the financing of specific projects, such as retooling factories, if their U.S. clients decide to make major investments in Eastern Europe. **– Susan E. Kuhn**

Minimal lending, minimal risk

U.S. BANK LOANS IN EASTERN EUROPE
(in millions, as of June 1989)

Yugoslavia	$1,631
Poland	$282
East Germany	$274
Hungary	$262
Bulgaria	$109
Czechoslovakia	$49
Romania	$4

WHAT'S HOT	WHAT'S NOT
Draped Italian suits	
Fake furs	
Arsenio Hall	
Imported vodka	
Japan bashing	
Bond funds	
Animated films	
Ted Turner	
Chapter 11	
White knights	
Texas	
Pearls	

■ As the last decade of the millennium begins, everything that was out is suddenly in again. The Lone Star State, Disney cartoons, and the Mouth of the South are making comebacks, while mink coats and Mexico's Corona beer are now hopelessly passé. Don't throw away your teal-green ties, however. They are still okay. But don't buy any, either: Ties with floral patterns have the edge. Glitz and glitter are doomed to go the way of the 1980s, says Barbara Feigin, executive vice president of Grey Advertising: "The 1990s will be marked by classic expressions of quality," such as intricate craftsmanship and—provided they are real—pearls. **– M.A.**

A NOSE FOR WINE

■ Levers, fans, and long plastic tubes reaching to the level of your nose from petri dishes—glass containers used in laboratory experiments. These are hardly traditional paraphernalia for people wanting to savor the aroma of wine. But such sniffing equipment is a hit among visitors to **St. Supéry Vineyards & Winery** in California's Napa Valley, which introduced two such sniffers in July.

The contraptions let you smell individual aromas that help make up the "nose" of the whites and reds that St. Supéry produces. Experts can tell the quality of a wine by the particular smells of its bouquet. St. Supéry visitors push four levers, each of which opens the cover over a petri dish. A fan

WHY GRADE 'A' EXECS GET AN 'F' AS PARENTS

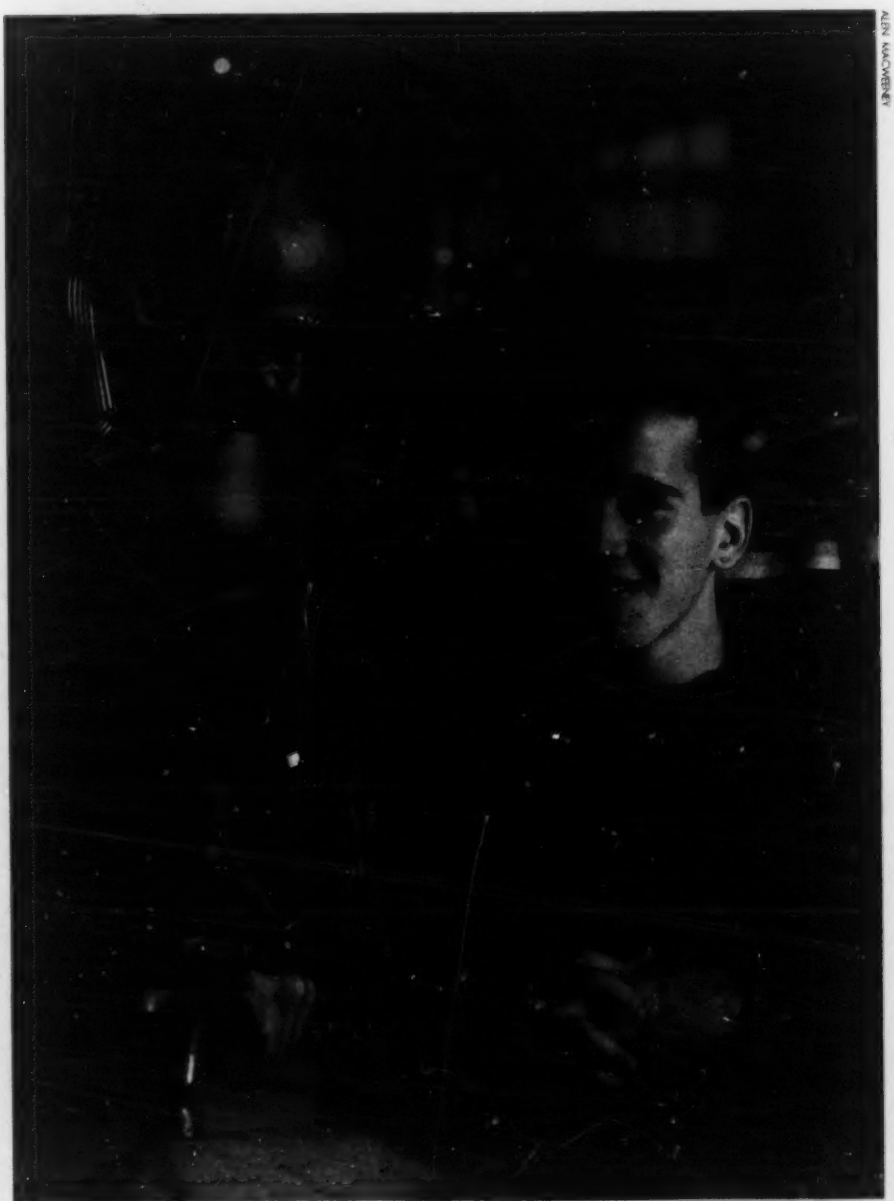
The qualities that make for corporate success are often not what are needed to be an effective mom or dad. Some parents show how to avoid the worst mistakes. ■ *by Brian O'Reilly*

YOU CAN SOLVE that thorny problem in Jakarta with a few crisp commands to your underlings, but ask your teenage son why he got in late last night and you're reduced to impotent fury in seconds. For all their brains and competence, powerful, successful executives and professionals often have more trouble raising kids than all but the very poor. Alas, the intensity and single-mindedness that make for corporate achievement are often the opposite of the qualities needed to be an effective parent.

Six years ago when AT&T was in the throes of divesting its operating companies, Ma Bell conducted a survey of its managers and top executives and discovered that their kids caused these employees more stress and worry than anything else, including their careers. Says attorney Robert Weinbaum, head of antitrust and marketing law at General Motors: "I think it's real tough for kids growing up in families where the parents are highly successful." Weinbaum went through years of turmoil with his own son before they resolved their difficulties.

Many parenting problems are common to everyone: paralyzing uncertainties about how strict or lenient to be, a sense of powerlessness in the face of peer pressure, preoccupation with professional problems, or just plain forgetting what a kid needs from mom or dad. But raising happy, successful children is not a hopeless task or just dumb luck. Interviews with scores of educators, psychologists, drug experts, executives, and troubled teens reveal some consistent differences between kids who turn out "good" and those who go "bad," and provide some suggestions on how to avoid the most colossal blunders.

The most important thing a parent can do for a child is to encourage a high sense of self-esteem. Easier said than done, of course. The tricky part is helping children set appropriate, satisfying goals and then



ALEX MACWHINNEY

Bob Weinbaum, a lawyer at GM, once did everything for his son John—even his homework.

ED KASH

The Yocams greet Apple's John Sculley.

providing an environment that lets them reach the goals on their own. Building your child's self-esteem is an inconvenient, time-consuming, and maddeningly imprecise occupation, and don't be amazed if you mess up. Intuition and good intentions often don't seem to be much help, and you need skills that rival a pilot's ability to land a jet at night on an aircraft carrier. But kids who have a sense of self-worth flourish. Kids who don't are vulnerable to drug and alcohol abuse, unwanted pregnancy, anxiety, depression, and suicide. Even worse, they may not get into Harvard.

In case your long-range plans include working triple time at the office until the brats turn 17, then deftly steering them into the Ivy League, listen up. Serious emotional problems usually start when children are in sixth to eighth grade, and hit crisis proportions by the sophomore year of high school. Says Sheila Ribordy, a clinical psychologist at De Paul University: "By junior year they're on track or in serious trouble."

DON'T THINK your brains, money, or success will pave the way to parenting glory. In a survey of large corporations providing extensive insurance coverage, Medstat Systems, an Ann Arbor, Michigan, health care information firm, discovered that some 36% of the children of executives undergo outpatient treatment for psychiatric or drug abuse problems every year, vs. 15% of the children of nonexecutives in the same companies.

Top executives have special problems as parents. Many are highly educated, driven personalities who routinely put in 12 to 15 hours a day on the job—workaholics, in other words. Says Susan Davies-Bloom, a Connecticut family therapist who treats senior managers: "They are so accustomed to functioning at a high level of control at the office that when they get home, they try to exert the same kind of control."

The milieu that executives attempt to establish at home can be highly stressful for children. The attributes a manager must develop to succeed include perfectionism, impatience, and efficiency. Says Andrée Brooks, author of *Children of Fast Track Parents*: "Contrast those traits with what it takes to meet the needs of a growing child—tolerance, patience, and acceptance of chaos."

During their teens, kids assert their own individuality, rebelling against whatever their parents value most. Unfortunately for the kids of driven executives, what mom and dad often value most is achievement. Says Davies-Bloom: "I find many workaholic executives felt they were mediocre in popularity, grades, and athletics." Frequently the parent tries to create a child who was everything he was not, or thinks he can steer the kid around every pitfall. Sparks fly, and the youngster refuses to perform.

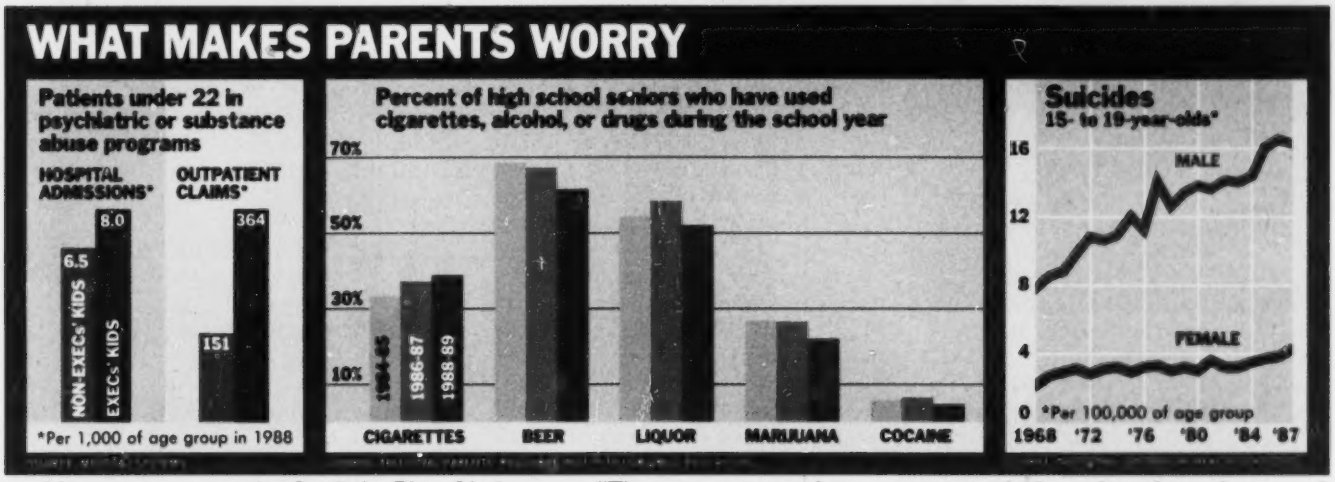
Worse, some parents are so absorbed with their own careers that they scarcely notice their children, who respond by behaving in increasingly bizarre and dangerous ways to attract attention. "My father worried about me from his desk," says the son of an IBM executive. The kid started stealing from his parents—trinkets, at first. But when he took his father's gun and began disappearing at night, family therapy finally began.

GIVEN 70-HOUR workweeks, divorce, or a spouse with a career or demanding social schedule, and complications set in fast. You thought buying a big home in a wealthy suburb would bestow bliss on your offspring? Too often it has the opposite effect. Thousands of business people who were No. 1 somewhere else move to towns where everyone else is successful too. All the other kids in school are very bright and also under pressure to achieve.

Soon the parents wonder why their kid isn't at the top of the class. Says Constance McCreery, formerly a public school guidance counselor in Darien, Connecticut: "In

DON HARDING

Chevron engineer Bob Butler takes time out to coach his son Darren's soccer team.



wealthy towns you get what I call the Big Apple syndrome. It's the problem of keeping all the children full of enough confidence that they *can* succeed."

MOM and a tightknit community used to be able to keep child rearing running smoothly even if dad was putting in overtime. But most younger mothers work nowadays, and wives of senior executives often have commitments that keep them out of the home, even if they don't have paying jobs. Suzanne Gelber, a benefits consultant, was on the board of a day care center in Chappaqua, New York, where most of the mothers who dropped off their kids did not work. "They have so many philanthropic and social responsibilities that they are very busy women," she says. "They are not home baking brownies."

Nobody can prove that children with nannies wind up in reform school more often than those who don't, but some kid watchers are concerned. Says Tom Collins, executive director of Fairview Deaconess Hospital, an adolescent drug treatment center in Minneapolis: "Every move you make away from kids in pursuit of your own happiness and career increases their chance of getting into trouble. Lending kids out to babysitters and day care makes it a crap shoot."

Ask a bunch of educators how life for well-to-do kids has changed over the years and you get a surprising answer: The children are under far greater strain than their parents ever were to perform well academically and win acceptance to high-prestige colleges. At New Trier Township High School near Chicago, principal Dianna M. Lindsay says, "The pressure to get into a name-brand college is monumental. I see kids buckle under it."

Part of the stress is classic pushy-parent stuff. Says Carol Perry, director of counseling at the exclusive Trinity School in Manhattan: "This is an era of designer children. No parent wants an average child." Adds Lindsay: "Parents want their kids to go to a school whose name is recognized at the country club."

Much of the mounting anxiety springs not from overt parental pressure, however, but from the students themselves, whose values have been not so subtly affected by mom and dad's affluence. Many well-off kids have grown up using a financial yardstick to evaluate themselves and others. But the prospects for these wealthy kids to improve on or at least maintain their current lifestyles are frighteningly slim. "Successful moms and dads come here because the environment breeds success," New Trier's Lindsay observes, "but the kids say, 'I can never match this. This is the best my life will ever be.' "

Students at New Trier are encouraged to do social service, such as working in soup kitchens, and once a year they are asked to fast for a day in recognition of world hunger and donate lunch money to the poor. Says Lindsay: "We have to teach the kids there are other standards besides material possessions. It's a real, serious problem."

The predictable consequences of all the stress on kids: alcohol, drugs, and suicide, the ultimate parental nightmare. Teenage suicide rates doubled between 1968 and 1987, to 16.2 per 100,000 boys and 4.2 per 100,000 girls. Suicide now ranks as the second cause of death, after accidents, among 15- to 19-year-olds. Some factors that prompt suicide, such as depression caused by the death of a loved one, are not the result of demanding parents. But pressure to do well in school and athletics is a contributor to suicide, and children in a close-knit family are less likely to kill themselves than kids without strong family ties.

Though drug use appears to have peaked in the early 1980s, it is still very high. According to the University of Michigan's Institute for Social Research, more than half of all high school seniors have reported using an illicit drug at some time in their lives—usually marijuana—and a third have tried something stronger. Virtually all seniors—92%—have experimented with beer or hard liquor, and in the two weeks before the institute's survey was taken, 35% had been drunk at least once although every state now bans drinking under age 21.

RARE IS THE PARENT who cannot recall sneaking more than a few beers in his or her youth, but the prevalence of teenage drinking has many people worried. Donald R. Geddis, the principal at Summit High School in New Jersey, is more concerned about the use of alcohol among his students than he is about any other substance. "Its use is so widespread it outstrips all others," he says.

Drinking is starting early—the average age for that first surreptitious sip is 13—before many children have developed better methods of coping with stress. Youngsters are aping the attitude of adults: "I've had a tough week and I'm entitled to blow off a little steam." Worse, drunk kids are also more likely to experiment with other drugs they would shun while sober.

Since practically every kid drinks and most experiment with drugs, what distin-

REPORTER ASSOCIATE *Sara Hammes*

CHARLIE ARCHAMBAULT

A stoic cadet gets discipline from a superior officer at Valley Forge Military Academy.

guishes those who tinker with the stuff from those who develop a serious dependency is "the degree of anxiety for which they are seeking surcease," says Virginia Kramer Stein, a clinical psychologist in New Jersey. Although no kid is as supremely self-confident as many try to appear, youngsters who think of themselves as losers or unwanted by their busy parents, or who have trouble making friends, are at a higher risk of abusing alcohol and drugs than other kids.

When they drink or take drugs, many kids feel transformed for the first time from awkward geeks into cool and appealing characters. "Addiction has a lot to do with self-esteem," says Jeri, 16, the daughter of a Minneapolis-area businesswoman. Jeri started drinking at 11; then her sister introduced her to marijuana, which she smoked every day through much of her first year of high school. By the time she was in tenth grade, she was caught selling grass, and sent to a rehabilitation program at Fairview Deaconess.

HOW DO PARENTS reduce the stress on their kids, boost their self-esteem, and keep them off drugs? Says Summit High's Geddis: "If I've learned one thing, it is that the main priority for parents is to help their kids find something that makes them feel good about themselves. That's the greatest deterrent to drugs and alcohol."

An important first step is to ease up on relentless pressure to make the youngster perform well in school. Focus only on grades and you're handing the kid a weapon to punish you with. If the child appears "only average" but is attending one of the toughest high schools in the country, find out where he or she ranks among peers on standardized achievement tests. That will help you know whether a B or C average is reasonable.

Do not greet your children every evening with an ostensibly cheery "How'd you do in school today?" It is a very threatening question and often elicits no more than a mumbled "Okay." Good grades help get you into a top college but don't predict a happy, successful life, says Robert Klitgaard, former faculty head of admissions at Harvard's Kennedy school.

In case you forgot, success in high school is not achieved the same way as success in a corporation. You get ahead in a company by climbing the ladder and paying your dues, concentrating on things you're good at, and delegating or avoiding areas where you are not competent. You may be a whiz at corporate finance in part because the job does not require you to decline French verbs or find the area of an isosceles triangle. But your sophomore does not have the luxury of hiring a Harvard MBA to do her homework.

continued

A DeSisto School therapist, left, leads a group session in which the young man lying on the kids' laps learns to trust the other students.

ARLENE GOTTFRIED

Don't ignore the possibility that the apple of your eye simply is not as smart as you are. Children have roughly the same IQ as the average of their parents', but there are plenty of deviations. About 7% of the time, a child will be 15 points higher or lower than the parents' average, and one time in a thousand, a 30-point difference will pop up.

THE AVERAGE college graduate has an IQ of 115 and Ph.D.s typically score 130, according to John E. Hunter, a professor of psychology at Michigan State University. "It doesn't take much of a slip, and the child of parents who struggled to get through college will not be able to make it," he adds. (Of course, there's an equal chance your daughter is justified when she calls you stupid.) Though you may be a genius yourself, if you married a good-looking but dim bulb, you can't expect your progeny to send rockets to Mars. If your kid has been a whiz all along, however, and his grades collapse in high school, emotional or drug problems are the likely culprits—not his IQ.

Spend time with the family. Ordering your secretary to book 50 minutes of "quality time" into your schedule is better than nothing, but quality time has a habit of fitting your routine, not the kids'. Del Yocam, 45, former chief operating officer at Apple, religiously went home for dinner at 7 P.M. at least twice during the week, and avoided business commitments on weekends. "The children have come to expect it," says Yocam. In November he retired from Apple. His devotion to his family didn't hurt his career there, Yocam says, but "it's time to move on to other things."

Hugh McColl, chairman of NCNB, the big Southern regional bank, cut out weekend golf and reduced entertaining at night years ago to have more time with his three children. But he still has some regrets about the time he spent away from home. He was coaching his son's YMCA basketball team in the early 1970s, and a league championship game was looming. Instead McColl went to a banking convention, and the team lost by two points. "My son still blames me," says McColl with a laugh. "He figures if I'd been at the game he would have won."

Says Levant, a psychologist: "Men are not trained to be empathetic listeners. We're taught to listen to our opponents to discover their weaknesses."

Robert Butler, a senior engineer at Chevron in San Francisco, is also determined not to let his job overwhelm his family. He schedules time for his children, leaving for the office at dawn on days he has to depart early to coach his son's soccer team. Says he: "You can always put things off for the future, but you can't get back the years with your kids."

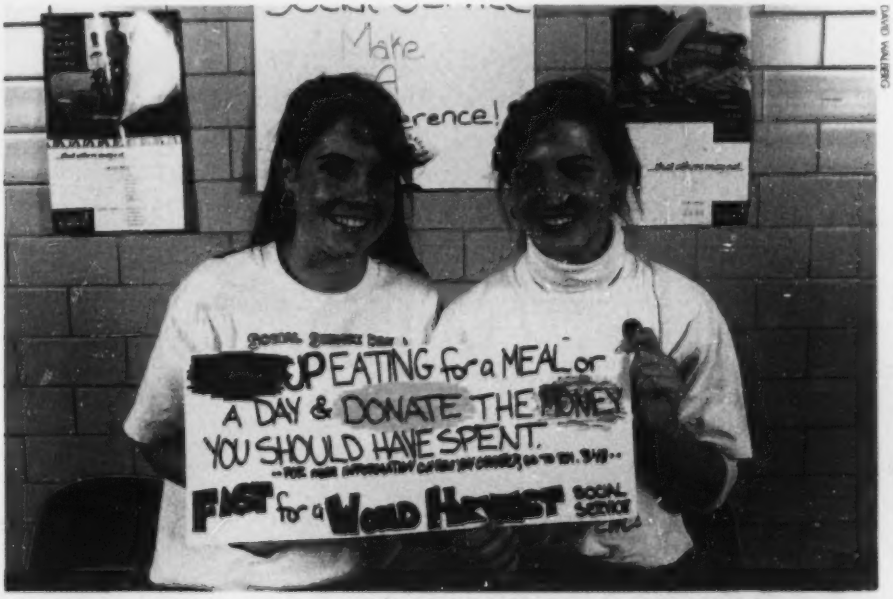
Use the time you spend with the children to listen sympathetically to them. That skill is particularly difficult for men to acquire, according to Ronald Levant, a Rutgers University psychologist and author of *Between Father and Child*. "Men are not trained to be empathetic listeners," he says. "We're taught to listen to our opponents to discover their weaknesses." Men see themselves as problem solvers, not as shoulders to cry on.

Thus, the father who comes home and sees that his 15-year-old daughter has just eaten a whole box of Oreos will probably want to warn her about pimples and weight. Resist the urge. Just let her pour her heart out. Don't be hurt or angry if she doesn't respond the first dozen times you try to be understanding. If you've been a clod for the past 15 years, she may be confused or think you're trying to trick her.

You may learn from all that listening that your son really doesn't want to go to Stanford, is the laughingstock of Kenilworth when you force him to practice drop-kicking at the country club, and dreads following your footsteps into the brake shoe business because he can't figure out what a brake shoe *is*. Fight the desire to disown him, and he may confess that he is fabulous at lawn bowling and likely to get a scholarship from East Cowflop University to study French cooking.

Go lawn bowling with him and let him whip up some frog legs Provençale for you. You won't enhance your bragging rights with the board of directors, but you will do wonders for his self-esteem. And you could be pleasantly surprised: You may find that a newly energized youngster has replaced the sullen adolescent of just a few weeks before. "There are no lazy teenagers," says Carol Perry. "More likely they're turned off or depressed."

SOME PARENTS conclude that boarding schools can do a better job of teaching and raising their children than mom or dad will. For example, a single parent who has to travel on the job might want the youngster in a stable environment that provides a sense of security for both child and parent. Such places range from exclusive prep schools



DAVID VALBERG

Once a year, students at New Trier High fast and donate their lunch money to the poor.

such as Groton, Exeter, and Lawrenceville, which rival Ivy League colleges in admission requirements and costs; to less well-known but highly regarded private institutions such as the Webb Schools in Claremont, California, St. Stephen's Episcopal School in Austin, Texas, and Wayland Academy in Beaver Dam, Wisconsin; to military academies like Valley Forge in Pennsylvania that boast of instilling "conservative Christian values" in their charges.

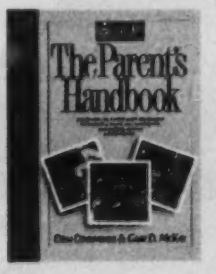
Then there are boarding schools where many of the kids have serious behavioral and emotional problems, among them drug abuse, petty theft, truancy, or depression. Among these academies are Cedu in Running Springs, California, Franklin Academy in Sabbatus, Maine, and the Brown Schools in Texas. Bob Weinbaum, the GM attorney, sent his son John to the DeSisto School, a prep school in Stockbridge, Massachusetts. With the Broadway producer Joseph Papp among the first board members, Mike DeSisto, a rumpled Catholic exseminarian who once ran a private school on Long Island, started the school in 1978. The annual tuition of $19,000 is more than the cost of a year at Yale.

In addition to a rigorous academic schedule, DeSisto students undergo multiple private and group therapy sessions each week. But an important part of their development occurs as the kids learn to be accepting of each other and affectionate. Most conversations seem to begin and end with vigorous bear hugs. DeSisto himself is both warm and demanding. He lets kids pile onto his living room sofa and fall asleep on his lap until the 10 P.M. curfew. But kids don't "graduate" until they complete the course requirements, perform well at increasingly difficult and responsible campus jobs from washing dishes to assigning dorm rooms, and demonstrate they can be effective "parents" for newer arrivals.

If you're committed to winning the Dad or Mom of the Year Award, one of the biggest and most common mistakes you can

A REPAIR MANUAL FOR FIXING RELATIONSHIPS WITH YOUR KIDS

If you spend most of your workday racing through terse memos to prepare for that presentation on expansion strategies for the 1990s, you're going to find it tough to absorb homey suggestions on child rearing. Touchy-feely stuff like "Help your children feel useful by identifying their talents and suggesting ways they can contribute to the family" may make your flesh crawl.



Giving goose bumps to executives hasn't hurt psychologists Don Dinkmeyer and Gary D. McKay, authors of *The Parent's Handbook* (American Guidance Service). The $9.95 paperback has sold nearly two million copies, making it one of the most successful publications ever on raising kids. Among its virtues is practicality. The book is short—only 127 pages including cartoons—and reads more like a repair manual than a scholarly treatise.

When McKay and Dinkmeyer were guidance counselors in the Midwest two decades ago, they were bombarded with questions from parents who, says McKay, "with the best of intentions, didn't know how to help their kids learn responsibility." The two men put together course material to help teachers, clergy, and school counselors, among others, lead group training sessions for frustrated parents. The *Handbook* is part of the course but useful on its own and available in most bookstores. Herewith some of the book's advice for moms and dads:

■ Don't give a child attention on demand, even for positive acts, because you will foster an inappropriate desire for the spotlight. Youngsters can easily come to believe that if you are not focused on them 100% of the time, you don't care about them.

■ Tell your children you love them, especially when they are not anticipating such a comment. Nonverbal signs such as pats, hugs, kisses, and tousling their hair are also extremely important.

■ Encourage kids rather than praise them. Praise is a reward given for winning and being the best. Encouragement, by contrast, is a reward for effort or improvement, however slight. It makes a child feel worthy, as in "I have confidence in your judgment" or "You seem to like that activity." Some praise is appropriate, of course. If the child hits a home run, go ahead and shout, "*Wow*, what a hit! That was great." Just don't restrict your pride in the child to his or her accomplishments.

■ Listen to your kid. Think of a feeling that describes the emotions a child is expressing—bored, guilty, vengeful, or happy, accepted, respected. When your son says, "That teacher is unfair. I'll never do well," don't respond with, "Of course you will. What's the matter with you?" Try: "You're angry and disappointed and you're thinking of giving up." The second response shows acceptance and concern so the child will be encouraged to tell you more.

■ Avoid blaming and criticizing your children. They will correct misbehavior faster if you dispassionately describe how that lapse interferes with your needs or rights. Instead of screaming "You came home three hours late last night, you idiot!" try "When you don't call or come home at the time we've agreed on, I worry that something might have happened to you because I don't know where you are."

■ Let your youngsters experience the consequences of their behavior once they know enough to make informed decisions. Children who won't eat go hungry; those who dress inappropriately get cold or get razzed by their peers. Buy good food that they like, but don't force them to eat it. The difference between dishing out punishment and letting them experience consequences is often in your tone of voice. If your son loses dad's hammer, you don't have to yell or threaten. The child should simply buy a new one. Dad is also justified in coolly explaining that junior apparently isn't ready to use Dad's tools.

■ Treat your children with the courtesy and sensitivity you reserve for your friends. With luck, they may turn out to be some of your very closest friends.

make awaits you: being a wimpy and overprotective parent. Says Gary McKay, co-author of *The Parent's Handbook* (see box): "One of the greatest handicaps a child can suffer is to be raised by a 'good' parent."

These well-meaning types try to do everything for the kids, rushing upstairs five times to wake them for school, exhorting them to eat breakfast faster, and driving them to school when they miss the bus. All this service winds up depriving the kid of self-confidence and independence, says McKay. Far better to be a "responsible" parent. Buy the youngster an alarm clock, explain that breakfast ends at 7:30, and if he misses the bus let him walk to school. Don't scold, don't say, "I told you so," don't debate, don't give in.

Bob Weinbaum fell into a good-parent trap, trying so hard to be a "fair and reasonable" father that he was coming across as overprotective, vague, and indecisive to his son John. "In retrospect, I wish I had remembered that *I* was the father—that *I* was the one in charge," says Weinbaum, whose credits include winning federal approval for the GM-Toyota deal in Fremont, California, and managing his son's baseball team. John grew up with a lot of love and attention, but Weinbaum now admits he tried to do too much for his son, even his homework. "John told me once I was so involved, I made him feel incompetent."

By the time John was a sophomore in high school, their relationship was in tatters, and both parents were worried. "I remember his violent outrages and kicking the door apart," says Weinbaum. "He was in a lot of pain." Schoolwork deteriorated, and the parents began finding marijuana butts on the floor. When the son started going to parties and not coming home at night, Weinbaum was frazzled. An adolescent treatment center in Detroit determined John's problems were not drug-related, so Weinbaum wound up sending John to the DeSisto School. He graduated in three years and is now at a college near Baltimore.

For all three years Weinbaum and his wife attended monthly group support meetings with other DeSisto parents in the Detroit area and gradually learned how to improve relations with John. "He is a spectacular, wonderful son," says Weinbaum today.

ANN CUTTING

Kids show care and support for each other at DeSisto.

If you plan to run out and start putting your foot down, do not mistake harshness or violence for firmness. Says one tall 17-year-old student at DeSisto: "My father used to throw me up against a wall, demanding that I get better grades. But there was never any follow-through." The boy wanted his parents to talk to him about why he was having trouble in school and offer some help, but they did not. Says he: "Parents often think if they've yelled and sent you to your room that their job is done."

Since so much experimentation with drugs and alcohol begins in the preteen years, start long before they're in sixth or seventh grade to communicate with your children, and practice being assertive. Says Bruce Thompson, superintendent of the middle school in Woodside, a San Francisco suburb: "This is the best time to catch them. They're still little kids, on the way to adults."

How strict is strict enough when dealing with kids on the verge of becoming teenagers? "You ask kids where they're going when they go out," says Thompson. "They do their homework and you check their homework. They show up for dinner, they don't go out on school nights, and when they say they're sleeping over at Johnny's, you call up Johnny's parents and ask if they will be home that evening. Will the child complain? Yes."

When kids in middle school and high school do go out at night, parents should be up and awake to greet them when they return. Says Tom Collins, head of Fairview Deaconess, the drug rehab center in Minneapolis: "Sit down and talk with your kids when they come in. You should be able to say to them, 'You look weird. Have you been doing drugs?' "

If you take time to observe a teen, you can soon tell whether he's drunk or stoned. Do kids want to be stopped? Absolutely. "If you don't see it soon enough," Collins warns, "your child will go through lying, stealing, cheating. It gets rolling and you can't stop it until the kid is in so much pain he wants treatment."

Many parents don't even suspect a problem until they find drugs or get a call from police or school officials. Warning signs that a kid is becoming an abuser include suddenly erratic grades, skipping school, dropping out of extracurricular activities, avoiding the family, swings in mood, violence, depression, no savings from a part-time job, and a crop of unfamiliar and unimpressive new friends.

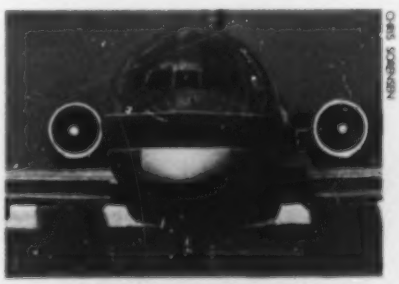
MOST PARENTS will never have to deal with anything more serious than their own chronic sense of clumsiness and frustration. In case you think you are hopelessly inept and suspect your kids secretly fired you a long time ago, be assured that you are far more influential than you suspect. "The best manipulation parents have is their attention. It is an extraordinary power that most of them neglect to use," says David, 17, the troubled son of a high-ranking Ford executive. "Parents are very important to kids—more than they will ever let on." ■

REVOLUTION IN THE AIR

Deregulation is shaking up international airlines' tidy world. Even Europeans now have to compete. ■ *by Wilton Woods*

THE ADJOINING TABLE shows the world's 50 biggest passenger airline companies, measured by 1988 revenues. Beneath the numbers lies a new reality: Swift changes are sweeping over—and shaking up—this global business. The U.S. megacarriers, turned loose by deregulation a decade ago, are spreading their wings across the oceans and forcing realignments around the world in the long-clubby industry. The Europeans are responding to the challenge, and the Asians are gaining ground rapidly.

Not long ago Europe's carriers divided up the routes in the home territory among themselves, set high prices, and split the profits. But the European Community is pushing toward its own deregulation in 1992, and already the game has vastly changed. Old war horses like British Airways have been rejuvenated by privatization, and upstart entrants have joined the battle for customers. European airlines have had to learn how to compete on price and service, and efficiency is at a premium.



CHRIS SORENSEN

Cleared for takeoff into a new world

To enhance efficiency, European carriers—including British Airways, Lufthansa, and Air France—have signed up with two new computer reservation systems that provide flight schedules to travel agents. One is linked to UAL's Apollo system, the other to Texas Air's System One. Believing that only the strongest will survive, many lines have placed orders for costly new planes and are planning to increase marketing budgets. Smaller carriers are looking for allies. Belgium's Sabena is planning to sell shares to British Airways and KLM, while Swissair and SAS are forming a partnership and buying each other's shares. Even heavyweights like Air France and Lufthansa are signing agreements to sell their services jointly in Europe and around the world.

Along the Pacific Rim, airlines have been surging as business and tourist travel booms in the prospering region. U.S. carriers are fighting to get more of the growing traffic across the Pacific, while Asian airlines are opening new routes to Europe. Air New Zealand has gone private, and Qantas may do so because the Australian government doesn't want to pay for a new fleet of planes.

All but two of the companies on this list showed increases in revenue in 1988, measured both in dollars and in their own country's currency. UAL, one of the exceptions, was deconglomerating by selling off some hotel and car rental operations. But the company's *airline* revenues were up.

The world's largest airline in terms of passenger volume, the Soviet Union's Aeroflot, is not on this list because the government does not provide meaningful numbers on revenues and profits. In 1988, Aeroflot, which spans a continent-size country without any competition and also flies to 100 foreign countries, logged 132.5 billion revenue passenger-miles. Its socialist service is such that Aeroflot's passengers often hold it up as an object lesson in the superiority of the free-market system. Even the People's Republic of China was getting ready to allow competition for its monopoly airline, CAAC (15.9 billion revenue passenger-miles annually), before economic reforms came to a halt. But freer—and stiffer—competition is clearly in the air for most of the world's airlines. ■

REPORTER ASSOCIATE *Mark Alpert*

THE TOP 50 AIRLINE COMPANIES

Rank by revenues		Country
1	UAL	U.S.
2	AMR	U.S.
3	TEXAS AIR	U.S.
4	JAPAN AIR LINES[1]	JAPAN
5	DELTA	U.S.
6	LUFTHANSA	WEST GERMANY
7	BRITISH AIRWAYS[1]	BRITAIN
8	AIR FRANCE	FRANCE
9	USAIR GROUP	U.S.
10	NWA	U.S.
11	ALL NIPPON[1]	JAPAN
12	SCANDINAVIAN AIR SYSTEM	SWEDEN
13	TRANS WORLD	U.S.
14	PAN AM	U.S.
15	HANJIN GROUP	SOUTH KOREA
16	ALITALIA	ITALY
17	SWISSAIR	SWITZERLAND
18	IBERIA	SPAIN
19	KLM[1]	NETHERLANDS
20	AIR CANADA	CANADA
21	QANTAS[2]	AUSTRALIA
22	SINGAPORE[1]	SINGAPORE
23	CATHAY PACIFIC	HONG KONG
24	PWA	CANADA
25	SAUDIA	SAUDI ARABIA
26	VARIG	BRAZIL
27	THAI INTERNATIONAL[1]	THAILAND
28	ANSETT TRANSPORT[1]	AUSTRALIA
29	JAPAN AIR SYSTEM[1]	JAPAN
30	AIR INTER	FRANCE
31	GARUDA	INDONESIA
32	SABENA	BELGIUM
33	AIR EUROPE[1]	BRITAIN
34	CHINA	TAIWAN
35	UTA	FRANCE
36	FINNAIR[1]	FINLAND
37	AIR NEW ZEALAND[1]	NEW ZEALAND
38	LTU	WEST GERMANY
39	SOUTHWEST	U.S.
40	ALASKA AIR GROUP	U.S.
41	TAP	PORTUGAL
42	OLYMPIC	GREECE
43	AUSTRALIAN[2]	AUSTRALIA
44	AER LINGUS[1]	IRELAND
45	AMERICA WEST	U.S.
46	AEROLINEAS	ARGENTINA
47	MEXICANA	MEXICO
48	AIR INDIA[1]	INDIA
49	S. AFRICAN AIRWAYS[1]	S. AFRICA
50	INDIAN[1]	INDIA

1988 REVENUES			PROFITS		TRAFFIC		COMMENTS
	% change from 1987				Billions of passenger-		
$ Millions	U.S. dollars	Local currency	$ Millions	Rank	miles	Rank	
9,014.6	(18.1)	—	$1,124.3	1	69.1	1	Owns United. Still unanswered: Who will wind up owning UAL?
8,824.3	22.6	—	476.8	2	64.8	3	Parent of American, which is overtaking United as the largest U.S. carrier
8,572.9	1.2	—	(718.6)	46	69.0	2	Took over Continental and Eastern. SAS has 9.9% stake. Still battling unions.
7,249.7	19.7	11.0	145.0	14	28.3	10	Flies more passenger-miles across the Pacific than anybody. Privatized in 1987.
6,915.4	30.0	—	306.8	6	49.1	4	Strong U.S. route system. Swissair owns 5% and Delta owns 5% of Swissair.
6,739.9	9.5	7.0	44.1	29	26.4	11	Proudly punctual. Government owns 51%. Has marketing ties to Air France.
6,690.4	25.0	15.1	331.3	5	30.5	7	Since the government got out, has become No. 1 international carrier.
5,953.7	9.2	8.1	193.5	10	21.4	12	Still flying the flag of France. Link with Lufthansa helps sell tickets.
5,707.0	90.2	—	165.0	12	30.4	8	Expanded from Northeast base by acquiring PSA and Piedmont in past two years.
5,650.4	9.9	—	135.1	17	40.1	5	Parent of Northwest, largest U.S. Pacific airline. KLM is buying a stake.
4,427.4	25.1	10.8	45.9	28	14.6	16	Domestic line going international. Routes stretch to Washington, D.C.
4,412.0	15.3	11.4	N.A.	—	8.7	26	Governments of Sweden, Denmark, and Norway share 50% ownership.
4,361.1	7.5	—	249.7	8	34.8	6	After taking over in 1985, Carl Icahn made the struggling carrier profitable.
4,165.1	15.9	—	(72.7)	43	29.0	9	The glory days are long gone; lost money in seven of the past eight years.
3,731.9	34.0	19.1	76.2	21	9.4	24	Parent of Korean Air Lines. Also owns an oceangoing container ship line.
3,258.1	5.1	5.5	368.6	3	11.5	20	Along with British Airways, has marketing alliance with United.
2,927.8	9.1	7.1	52.0	25	9.2	25	In addition to its stake in Delta, is forming a partnership with SAS.
2,874.2	16.1	9.5	208.2	9	13.0	18	Though the government still owns Iberia, privatization is expected.
2,823.2	6.4	3.8	158.7	13	14.5	17	On top of its interest in Northwest, wants a piece of Belgium's Sabena.
2,777.8	17.6	9.4	77.8	20	15.6	14	Profits set a record after the government sold shares to the public.
2,257.5*	26.4*	15.1*	139.8*	15	14.6	15	Government-owned international carrier; has stake in Air New Zealand.
1,993.0	20.5	15.2	299.0	7	16.0	13	Famous for service in the Far East; now has a marketing link with Delta.
1,933.5	28.8	28.9	361.6	4	12.5	19	Riding the Asian boom, but outlook for its Hong Kong base is cloudy.
1,764.1	25.0	16.3	24.6	33	11.2	21	Parent of Canadian Airlines International, Air Canada's main competitor.
1,697.2	(5.6)	(5.6)	(177.6)	45	9.6	22	The kingdom's airline does big business carrying pilgrims to Mecca.
1,531.2	16.9	1,066.1	(32.6)	42	8.6	27	Best service in Latin America. Employees own 85% of the stock.
1,428.0	30.3	27.6	165.1	11	9.4	23	Government-owned line acquired Thailand's domestic carrier in 1988.
1,314.3	35.0	23.0	133.6	18	7.0	32	Operates airlines in Australia and New Zealand. Rupert Murdoch owns half.
1,258.5	18.9	10.2	17.1	37	4.1	43	Fast-growing private competitor of Japan Air Lines on international routes.
1,238.7	10.2	9.1	24.9	31	4.7	42	Privately owned domestic French carrier; losing passengers to fast trains.
1,104.8	21.6	29.0	52.1	24	7.9	28	To fly from one Indonesian island to another, you have no other choice.
1,093.5	4.3	3.1	9.1	40	4.1	44	British Airways wants a stake along with KLM. Extensive African routes.
1,085.2	N.A.	N.A.	22.2	35	7.4	30	Tour-package charter operator expanding into scheduled service.
1,035.7	17.3	5.3	64.1	22	6.0	35	Investor-owned line will get competition from a new carrier in 1990.
1,024.9	8.3	7.3	131.5	19	3.4	48	Privately owned French airline with routes in Africa and South Pacific.
1,022.6	25.2	19.2	14.8	38	4.8	41	Still 70% government owned, but plans to offer more shares to public.
1,017.1	12.1	1.4	46.2	27	6.1	34	Privatized in 1989. AMR owns 7.5%, Japan Air 7.5%, Qantas 19.9%.
963.3	22.0	19.3	N.A.	—	5.3	38	International tour package and charter operator; privately owned.
841.8	8.2	—	58.0	23	7.7	29	A model for deregulation, it expanded from routes wholly within Texas.
814.4	14.7	—	37.5	30	3.9	45	Prospering in a regional West Coast niche with emphasis on service.
800.0*	41.9	48.9	N.A.	—	3.5	47	Longtime state-owned money loser is struggling to turn around.
799.5	9.9	15.2	(77.2)	44	4.9	40	Once owned by Aristotle Onassis; the government can't make it pay either.
792.9	28.2	16.8	36.7	31	3.6	46	State-owned domestic carrier was crippled by a pilots' strike in 1989.
785.3	6.2	3.6	49.1	26	1.8	49	Homesick Irish emigrants pack the government airline's planes back to the old sod.
775.7	34.8	—	9.4	39	7.1	31	Most successful of post-deregulation startups. Ansett of Australia owns 20%.
773.5	49.5	360.4	23.9	34	5.1	39	The government tried to sell control to SAS in 1988, but deal fell apart.
749.2	19.1	96.4	135.3	16	6.7	33	Foreign investors are welcome. Sir James Goldsmith is among them.
736.4	3.0	10.6	(31.2)	41	5.6	36	Recently spiffed up its planes to attract international business travelers.
709.0*	N.A.	N.A.	N.A.	—	N.A.	—	Seeking a low profile, the government no longer releases figures.
665.6	4.0	11.7	21.7	36	5.4	37	Government-owned domestic carrier with cheap fares. You get what you pay for.

*Estimate. †Figures are for fiscal year ended March 31, 1988. ‡Figures are for fiscal year ended June 30, 1988.
§Figures are for fiscal year ended September 30, 1988. ¶Figures are for fiscal year ended October 31, 1988.

GETTING HIGH TECH BACK ON TRACK

Without waiting for a government policy, smart managers can do plenty to restore America's edge over rivals who are winning markets worldwide. Here's how. ■ *by Joel Dreyfuss*

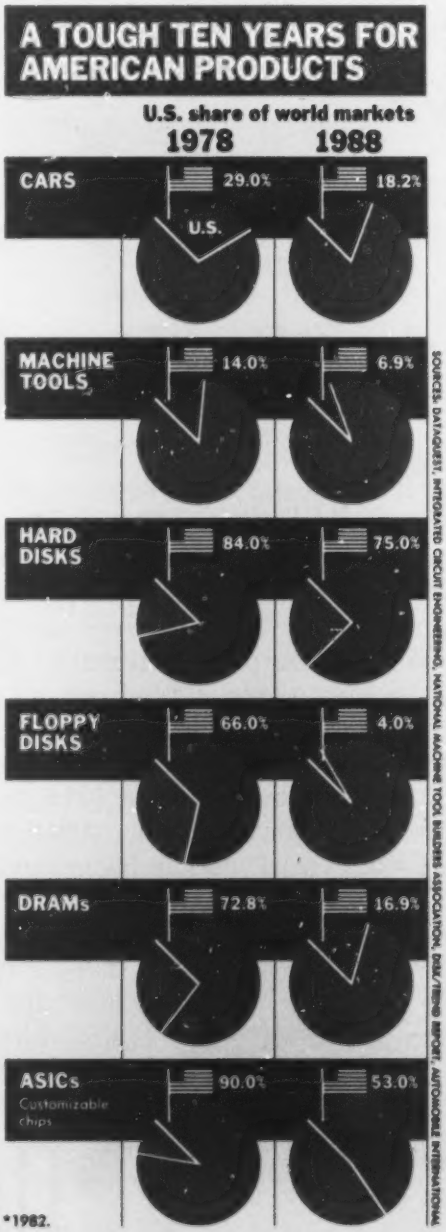
YOU'VE GOT TO WORRY about American technology when the newspapers seem to tell you there's less of it every day. Nikon emerges as the leading candidate to buy the division of Perkin-Elmer that makes semiconductor manufacturing equipment, one of the few major U.S. operations left in that business. Japan's Chugai Pharmaceutical buys Gen-Probe, a California biotech company—the first outright Japanese takeover in that industry. France's Groupe Bull is set to acquire the computer business of Zenith Electronics, the biggest U.S. player in the fast-growing laptop computer game.

At least those U.S. companies are getting handsome sums for the technology they're giving up. Many others are participating in joint ventures or licensing arrangements that allow foreigners to get control of their technology and use it against them. And far more are simply losing to foreign competitors in a wide range of high-tech industries that will be critical in the economy of the future (see chart).

Most Americans know that in semiconductor manufacturing, memory chips, machine tools, and consumer electronics the U.S. has fallen far behind the rest of the world. They may not know that where America still leads—in advanced computer chips, supercomputers, composite materials—overseas companies are coming on strong. Japan has launched well-organized research efforts in such technologies of tomorrow as superconductivity and high-definition television. More than America's economic welfare is at stake: The Pentagon considers 22 technologies vital to U.S. security, and America leads the world in just ten of them (see table, page 76).

What to do? Some people advocate letting free markets do their work, arguing that they lead to the best investment choices. Others insist that the U.S. government should work with industry groups to identify and support critical technologies. The debate is turbulent, its outcome highly uncertain except in one respect: Whatever happens won't happen fast. And in the world of technology, managers cannot wait.

REPORTER ASSOCIATE *Laurie Kretchmar*



That's why the smartest technology companies aren't holding their breath for the U.S. to sort out its policy. They are taking action right now that will improve their world competitiveness. Here are the most important rules they're following:

■ **GUARD INTELLECTUAL PROPERTY.** A piece of silicon may cost just a few dollars, but the knowledge of how to design and make complex integrated circuits is worth millions. Fighting a theft of intellectual property is difficult, but the payoff can be huge. Japan's patent office in October awarded an enormously valuable semiconductor patent to Texas Instruments after a 30-year battle. Corning in December settled a lawsuit by collecting $25 million from Sumitomo Electric Industries and keeping important optical-fiber patents that Sumitomo was trying to take away. IBM has collected millions in royalties from PC clone makers in Taiwan and South Korea. A relentless fighter for intellectual property rights, IBM has also won well-publicized copyright victories over Fujitsu and Hitachi. Supporting U.S. companies is a federal law that lets them block imports that they claim poach on their intellectual property.

American enterprises have often sold technology to the Japanese only to see it come back and beat them. A safeguard: Define exactly what you are selling. When Japanese giant Matsushita asked Spectra-

The U.S. industry has done no better in many high-tech industries than it has in low- and middle-tech businesses over the past decade—although a number of American executives were betting otherwise.

Milliken, a leading supplier of seat fabric to demanding Japanese automakers, uses a high-tech system to match cloth colors at this plant.

fax, a small company in Naples, Florida, to design a circuitboard that would enable personal computers to send and receive fax messages, Chairman Tom Conwell and President David Rae were determined to keep control of their core technology. After long negotiations, Spectrafax agreed to design a fax board that would be sold under the Panasonic brand. But Spectrafax could develop related products—and is doing so, designing "broadcast" systems for stock firms and other companies that send large numbers of faxes. "You have to avoid selling all your ideas in one fell swoop," says Rae. "You have to make sure the technology you license is also technology you can use and develop."

■ **SEEK TECHNOLOGY EVERYWHERE.** While some 7,000 Japanese study or work at laboratories in the U.S., fewer than 200 American scientists do so in Japan. The Massachusetts Institute of Technology has been trying to correct the imbalance. A program there placed 43 MIT graduates as interns in Japanese labs in 1989. But experts agree Americans need to know far more about what's going on in foreign labs.

Use all your overseas resources to search for technology. Robert Reich, who teaches at Harvard's Kennedy School of Government, suggests that U.S. companies assign sales offices and subsidiaries abroad the job of intelligence gathering, as the Japanese have done for years. Says he: "We are so used to the flow of knowledge from us outward that we have not reoriented ourselves." Some companies recognize Japan as a fertile source of new technology. IBM and Du Pont have large R&D operations there; Eastman Kodak, Texas Instruments, Digital Equipment, and others are scrambling to join them.

Don't forget to look in your own backyard. Small U.S. companies often complain that large American enterprises ignore them. Crystal Semiconductor, a startup manufacturer of analog-to-digital integrated circuits in Austin, Texas, was frustrated in its attempts to find a U.S. source of capital. "American companies gave us the back of their hand," says L. J. Sevin, an investor who is supporting the company and has backed Compaq, Cypress Semiconductor, and other successful ventures. "Our established large corporations have an arteriosclerosis problem." Crystal eventually turned to Japan's Asahi Chemical, which bought a 7% stake for $3.5 million and paid $2 million for licenses.

Listen hard, even if practical use of a technology seems far off. Niels Reimers, director of technology licensing at Stanford University, has spent more than a year trying to interest U.S. companies in a computer storage technique being developed at the university that could put the contents of a compact disk on a surface the size of a fingernail. He concedes that a marketable product is years away but is dismayed by the negative response of many American corporations. A number of major Japanese companies have knocked on his door, eager to acquire licenses.

■ **MAKE ALLIANCES, CAREFULLY.** By now plenty of companies accept that alliances may be the only way to develop cer-

PHOTOGRAPH BY ANN STATES—SABA PRESS

tain complex technologies or expand into some markets. Even IBM is collaborating with Toshiba on flat screens for computers. But companies quite properly worry about their partners learning too much. Motorola trades microprocessor technology to Toshiba for memory-chip-manufacturing techniques, a risky move that gives Japan access to a technology in which the U.S. still leads. Motorola says the deal helps both companies. But senior vice president Hector Ruiz concedes there's always a danger: "The companies we're dealing with are phenomenal competitors. There's always the concern that they will outperform us."

Make a cleareyed assessment of your potential partner's motives. T. J. Rodgers, outspoken president of Cypress Semiconductor, which makes leading-edge semiconductors, has been wary of alliances. He has licensed Matra, a French company, to manufacture and sell certain Cypress products in Europe. But after negotiating with ten Japanese companies over two years, he has not signed with a single partner. Reason: "We concluded that every company we negotiated with was after our technology, would blow us out of the Japanese market, and would come after our U.S. market." Rodgers is building his own sales operation in Tokyo.

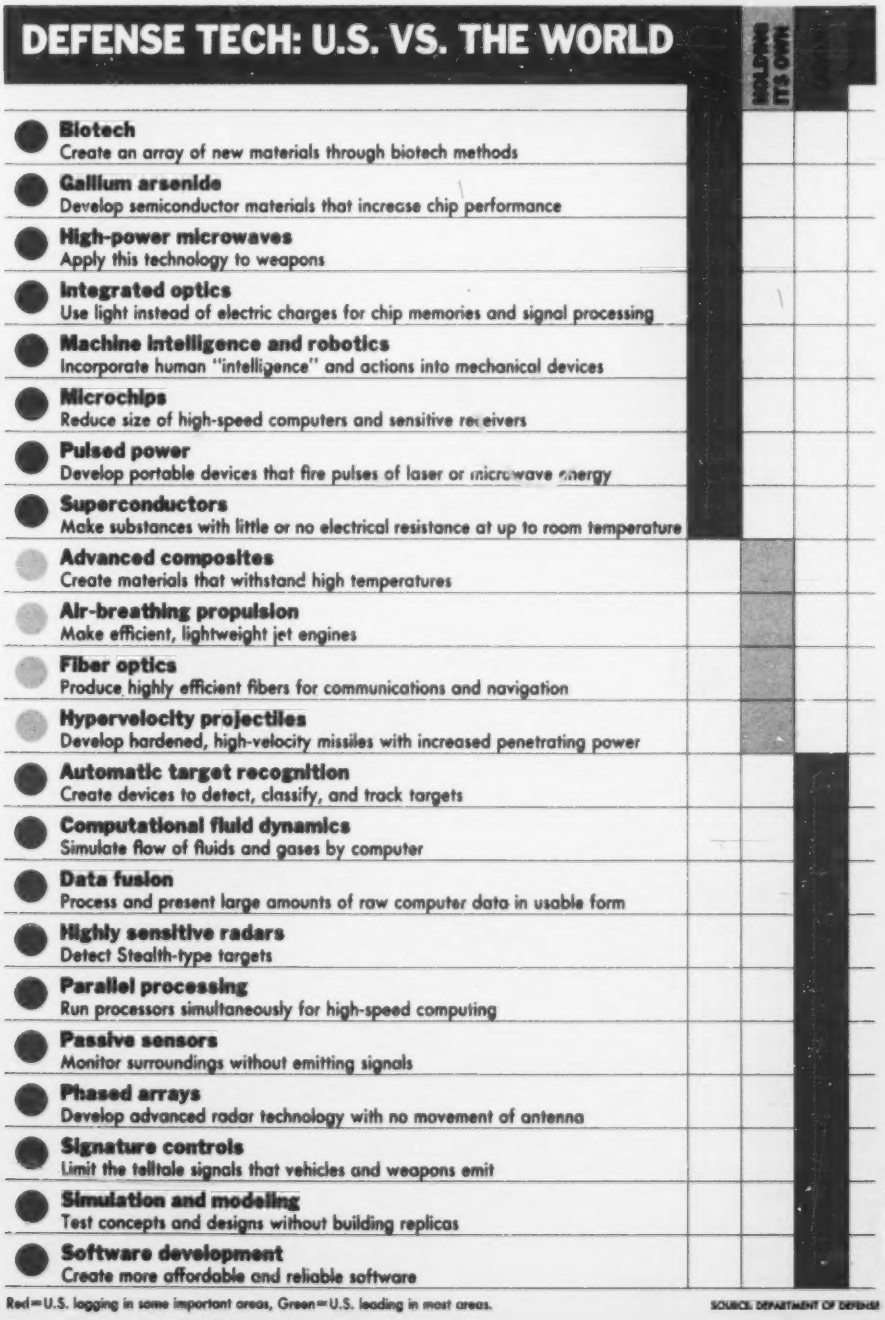
Consortiums can help spread research costs and may give you access to talent. Experts say those that are clearly focused on a specific goal, like Sematech, which is developing advanced chip-manufacturing techniques, are most likely to work. Drumming up interest is another matter. IBM has America's only privately owned synchrotron—a device for creating the most advanced chips—and has invited other companies to use the machine. Exactly one company, Motorola, has signed on. George M. Scalise, president of Maxtor, a manufacturer of hard-disk drives, has been trying to organize a consortium to do R&D on storage technologies. U.S. drive makers lead the world, but Scalise thinks the Japanese are catching up. His U.S. competitors are so caught up in a price war that they haven't paid him much mind.

■ **QUALITY, QUALITY, QUALITY.** Advanced technology won't get far if it isn't turned out with high quality. The Malcolm Baldrige National Quality Award administered by the U.S. Commerce Department signals government's recognition that American companies need a push to match the competition. In November, President Bush handed out awards to the 1989 winners, Xerox and Milliken, the South Carolina textile manufacturer.

While Xerox engineers advanced copier technology, more than 100,000 employees took the company's 30-hour course on quality. Workers are trained to understand how parts they work on will be used and to find out whether workers down the line are satisfied with them. Xerox says it is perhaps the first U.S. company to win market share back from Japanese competitors. Its share of the small-copier market fell from 16.7% in 1979 to 8.6% in 1984 but has since rebounded to 14.6%, according to Dataquest.

Milliken believes it uses computers better than competitors do. A sophisticated system can check fabric colors with high accuracy. Another computer lets designers customize colors and patterns of carpet tiles on a computer screen, send designs di-

DEFENSE TECH: U.S. VS. THE WORLD


HOLDING ITS OWN
Biotech
Create an array of new materials through biotech methods
Gallium arsenide
Develop semiconductor materials that increase chip performance
High-power microwaves
Apply this technology to weapons
Integrated optics
Use light instead of electric charges for chip memories and signal processing
Machine intelligence and robotics
Incorporate human "intelligence" and actions into mechanical devices
Microchips
Reduce size of high-speed computers and sensitive receivers
Pulsed power
Develop portable devices that fire pulses of laser or microwave energy
Superconductors
Make substances with little or no electrical resistance at up to room temperature
Advanced composites
Create materials that withstand high temperatures
Air-breathing propulsion
Make efficient, lightweight jet engines
Fiber optics
Produce highly efficient fibers for communications and navigation
Hypervelocity projectiles
Develop hardened, high-velocity missiles with increased penetrating power
Automatic target recognition
Create devices to detect, classify, and track targets
Computational fluid dynamics
Simulate flow of fluids and gases by computer
Data fusion
Process and present large amounts of raw computer data in usable form
Highly sensitive radars
Detect Stealth-type targets
Parallel processing
Run processors simultaneously for high-speed computing
Passive sensors
Monitor surroundings without emitting signals
Phased arrays
Develop advanced radar technology with no movement of antenna
Signature controls
Limit the telltale signals that vehicles and weapons emit
Simulation and modeling
Test concepts and designs without building replicas
Software development
Create more affordable and reliable software

Red=U.S. lagging in some important areas, Green=U.S. leading in most areas.

SOURCE: DEPARTMENT OF DEFENSE

BOB MARCHEWKA

Xerox, a 1989 National Quality Award winner, used a team from manufacturing, design, and customer service to create copiers that won back market share from the Japanese.

rectly to a mill, and produce samples almost immediately. Milliken is proud that it has cracked the tight circle of suppliers to Japanese automakers in the U.S., providing almost half their seat material.

■ **FOCUS ON MANUFACTURING.** Too many U.S. companies still assume that technological advance is a matter of brilliant design. That's vital, of course, but not worth much if the design cannot be efficiently manufactured. Taking that fact to heart is not easy. Hewlett-Packard, for example, had a reputation as a designer's paradise. As an executive says, "Manufacturing was just there to turn some of these nifty ideas into products." But when Chief Executive John Young shocked employees by declaring in 1980 that the company would improve quality by a factor of ten, things had to change.

To develop its highly successful lines of ink-jet printers, H-P abandoned its practice of letting designers hand down products. Instead, everyone involved with the products had to help answer the inevitable difficult questions. How much money could they spend to avoid a one-week delay in meeting a target date, or to achieve a 1% increase in sales, or to lower the cost of a part by $1? Suppliers came into the process early to test several methods for making parts. The team set up and ran prototype assembly lines to work out the bugs before going into full production. Result: H-P's inexpensive DeskJet and PaintJet printers have cut deeply into the dot-matrix market dominated by Japanese companies.

Give manufacturing the respect it deserves. When Steve Jobs launched Next Inc., he decided his workstation company would live or die on manufacturing. "I set out to place manufacturing at the highest level of prestige in the company," he says. He created an almost fully automated factory and eliminated all but a half-dozen hourly workers. An engineer can design a circuitboard on his computer, send the specs by modem to the plant, and pick up a *manufactured* board 20 minutes later.

Jobs says the Next factory solders components to circuitboards with a defect rate of 20 parts per million, ten times better than some of the best Japanese operations. He says it is also a recruiting tool for manufacturing engineers: "Once we show them the plant, their minds are blown." For a while Next had more Ph.D.s in manufacturing than in design—a statement not many U.S. companies could make.

Maxtor's Scalise believes U.S. hard-disk makers must join forces to stay ahead.

BOB KOSH

■ **UNIVERSITIES CAN HELP—REALLY.** Many managers think of universities as ivory towers, but academic manufacturing experts are eager to solve real-world problems for companies large and small. Rensselaer Polytechnic Institute in Troy, New York, is one of a growing number that receive state or federal funds to help companies improve manufacturing. The university's Center for Advanced Technology in Automation and Robotics recently consulted with Standard Gauge, an 80-year-old manufacturer of measuring instruments in Poughkeepsie, New York. Ten women there assembled the gauges by putting together 35 to 40 parts by hand. RPI is developing a robot that will produce three subassemblies and double productivity.

Carnegie Mellon's Robotics Institute may sound all ivy and chrome, but it also tackles business problems. "Some of the most interesting technical developments come from close collaboration with industry," explains Mark Fox, director of the institute's center for integrated manufacturing decision systems. Some recent Carnegie Mellon projects: an expert system to help Edgewater Steel, a small manufacturer of rings and wheels just outside Pittsburgh, manage an inventory of 100,000

JOSE A. FERNANDEZ

Spectrafax's Rao and Conwell sold to the Japanese *and* kept their technology.

tools; a hand-held scanner that maps underground pipes for Southern California Gas; and an artificial intelligence program that cuts distribution costs at Digital Equipment by better allocating delivery trucks.

Can America regain its technological lead? Of course it can. World competition in this area is not invincible, just formidable. But regardless of whether the U.S. adopts a technology policy—an issue on which the Bush Administration is divided—the nation will not return to its former technological preeminence unless thousands of individual companies perform better. By following America's best examples, they can start doing this tomorrow. And they had better. ■